## REMARKS

This application has been reviewed in light of the Office Action dated July 23, 2007.

Claims 1 and 3-35 are now presented for examination. Claim 1 has been amended to include the subject matter of dependent claim 2; claim 2 has been cancelled without prejudice. Claims 11 and 12 have been amended to depend from claim 1 instead of from claim 2. Claim 33 has also been amended. Claims 1, 30 and 35 are independent. Favorable review is respectfully requested.

Claims 7, 10, 11 and 12 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. The Examiner stated that the term 'preprocessing' was not described in the specification. The Examiner's attention is respectfully directed to the following paragraphs in the specification where the term 'preprocessing' is discussed: (1) paragraph 31, page 9; (2) paragraph 58, page 16, with reference to Figure 4; (3) paragraphs 103-104, pages 28-29, with reference to Figure 3; (4) paragraphs 107-108, pages 29-30; (5) paragraph 124, page 36; (6) paragraphs 150-151, page 49.

Claims 1, 2, 9, 14-18, 30, 32, 33 and 35 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. The Examiner stated that the term 'fitness score' was recited in the claims, without a description of how the fitness score is generated. The Examiner's attention is respectfully directed to the following paragraphs in the specification where the term 'fitness score' and methods for determining the fitness score are discussed: (1) paragraph 35, page 9; (2) paragraph 43, page 12; (3) paragraph 57, page 15; and (4) paragraph 87, page 23, with reference to Figure 2. As noted in paragraph 41, the present invention may be practiced by using an algorithm such as "GenD" to calculate a fitness score. The "GenD" algorithm was published in 2000 and is known to those skilled in the art. Paragraph 87 contains a definition of a fitness score: "the error in predicting the known output variables of the testing sets on the basis of the corresponding input variables of the testing set."

Claims 2 and 33 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. The Examiner stated that the term 'pseudorandom' was not described in the specification. (Claim 2 has been cancelled and the subject matter thereof incorporated into claim 1.) It is respectfully submitted that the term

'pseudorandom' is used in mathematics with a well-known meaning. It is well known that in practice the generation of a pure random number is not possible; some sort of deterministic process must be used to generate "random" numbers. A repetition of such a number with a certain cycle will occur in any case after a very large number of intermediate numbers have been generated. This condition is understood to be pseudo-random. As noted in the specification (paragraph 18, page 6), the term 'pseudo-random' is known to those skilled in the art. Claim 33 has been amended to explicitly state a brief definition of the term 'pseudorandom' in the claim, namely a distribution formed by a deterministic mathematical process. This definition also appears in amended claim 1.

Claims 2, 6, 7, 10-13, 31 and 33 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. The Examiner stated that no algorithm, formula or method was described in the specification for "optimization". It is respectfully submitted that "optimization," as recited in originally-filed claim 1, refers to performance of the claimed method. As taught in the specification (see especially paragraphs 103-112, with reference to Figures 3 and 6), the method is used to generate a prediction algorithm to arrive at a best distribution of data records.

It is earnestly believed that all of the claims are in compliance with 35 U.S.C. § 112.

Claims 1-9, 11-13, 23-25 and 30-35 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Buscema ("Scientific Background of Dynamic Adaptive Systems") in view of Feldgajer (U.S. Pat. No. 5,832,466). Claim 2 has been cancelled, thereby rendering rejection of that claim moot. The applicant respectfully submits that amended independent claim 1 and independent claim 30 are patentable over the art cited by the Examiner, for the following reasons.

The present invention, as defined in claim 1, is directed to a method including the step of defining one or more distributions of database records onto respective training and testing subsets; using this defined set to train and test a first generation set of prediction algorithms; and feeding those prediction algorithms to an evolutionary algorithm which generates a set of second generation algorithms. In addition, claim 1 recites that a fitness score is assigned to each generated prediction algorithm. Similarly, claim 30 recites generating and training a population of prediction algorithms, calculating a fitness score for each, and applying an evolutionary algorithm to succeeding generations of prediction algorithms.

Buscema discloses that, given a certain artificial neural network and given a database of known cases comprising known input variables associated to known output variables, the records of that database are randomly distributed on a training data set and on a testing dataset. Buscema does not disclose that an optimization of the distribution of the data records on the training and on the testing dataset can be obtained by the steps disclosed in amended claim 1 or in claim 30.

In addition, Buscema does not disclose that an optimization of the distribution of the data records on the training and on the testing dataset can provide for an optimisation of a trained artificial neural network (ANN), that is, a network able to operate on unknown cases and make predictions. In the present application, by contrast, different ANNs being better (or worse) in carrying out a prediction function can be obtained by taking the database of known cases and carrying out training and testing steps of the ANN several times, each time choosing a different distribution. The fitness score is defined as the ability of a trained ANN to calculate an output which is nearest to the known output by using the testing database.

In practice, by feeding to the ANN the input data of certain data records of known cases not used for the training of the database, it is possible to measure the ANN's predictive skill or precision, by comparing the output of the ANN generated using input variables of a known record with the corresponding known outputs.

Once a population of prediction algorithms has been developed, that population can be used for generating a new generation of ANN by means of a genetic algorithm. The genoma of the different ANN are the distribution of the data records onto the training and testing set; each ANN derived from a different distribution has a correspondingly different fitness score. This score is used to generate the ANN of a succeeding (child) generation.

Feldgajer is understood to suggest the use of genetic algorithms, not for generating the best training and testing database of an ANN, but in order to determine the best architecture of the ANN itself, particularly relating to the parameters influencing the training or learning step. According to Feldgajer, parameters to be varied and identified by means of genetic algorithm techniques are those which influence training response (in particular, training rate and momentum). Feldgajer is concerned with the dynamic manipulation of those parameters. Feldgajer does not disclose or suggest that an improvement in the performance of a predictive algorithm (such as an ANN) can be obtained by distribution of the data records of a database of known cases onto a training and onto a testing set. Furthermore, Feldgajer does not disclose

that a database of known cases should be subdivided into a training and into a testing set.

Feldgajer might be considered to suggest use of a genetic algorithm in the preparation of an ANN. However, Feldgajer does not disclose or suggest generating a population of prediction algorithms and applying an evolutionary algorithm to that population, as recited in claims 1 and 30. Feldgajer is also not understood to suggest training a prediction algorithm (such as an ANN) with different training sets, as recited in the claims.

Dependent claims 10, 14, 21 and 22 were rejected under 35 U.S.C. § 103(a) as unpatentable over Buscema and Feldgajer in view of Lapointe et al. Lapointe et al. is understood to disclose a method in which a set of data is partitioned into training and testing files (paragraph 91), and training of neural networks using training partitions. Lapointe et al. does not mention generations of prediction algorithms (or generations of networks), and does not disclose or suggest an evolutionary algorithm or assigning a fitness score, as recited in claim 1. Lapointe et al. thus does not remedy the defects of Buscema and Feldgajer as references against the present invention, so that the dependent claims listed above would not have been obvious from Lapointe et al. or from a combination of the references.

Claims 15-17, indirectly dependent from claim 1, were rejected under 35 U.S.C. § 103(a) as being unpatentable over Buscema and Feldgajer in view of Boden (U.S. Pat. No. 5,708,774). Claims 15-17 all directly depend from claim 14 and incorporate all of the features of claim 14. Claims 15-17 thus characterize the evolutionary algorithm as a genetic algorithm with certain evolutionary rules. One of these rules is that individuals having a fitness value lower or equal to the average health of the entire population are not excluded from the creation of new generations but are marked out and entered in a vulnerability list. Neither Buscema nor Feldgajer offers a disclosure of such an evolutionary rule. Boden is understood to disclose automated testing software including a "fitness function" for evaluating individual call sequences (col. 5, line 66, to col. 6, line 15). Boden teaches (col. 6, lines 8-15) that succeeding generations are chosen based on the fitness function, and states that "individuals of low fitness value may not be selected at all." Boden therefore does not teach or suggest that individuals having a fitness value lower or equal to the average health of the entire population are marked out and entered in a vulnerability list, as required by claims 15-17. Accordingly, none of the cited references, nor a combination thereof, suggests that individuals having a fitness value lower or equal to the average health of the entire population be not excluded from the creation of new generations but rather marked out and entered in a vulnerability list. Accordingly,

claims 15-17 would not have been obvious from any of the cited references, or from a combination thereof.

Claims 18-20, dependent from claim 14 (and indirectly from claim 1), were rejected under 35 U.S.C. § 103(a) as being unpatentable over a combination of Buscema, Feldgajer and Lapointe et al., in view of Boden and Burke et al. ("A Genetic Algorithms Tutorial Tool for Numerical Function Optimisation"). Burke et al. is understood to provide a basic teaching regarding genetic algorithms. Burke et al. does not teach or suggest the above-noted limitations of claim 1 regarding using a distribution of database records associated with a selected prediction algorithm, as recited in claim 1. Furthermore, Burke et al. does not teach or suggest the above-noted limitations of claim 14 regarding generations marked out and placed on a vulnerability list. Accordingly, Burke et al. does not remedy the defects in Buscema, Feldgajer, Lapointe et al., and Boden as references against the invention defined in claims 18-20. Claims 18-20 therefore would not have been obvious from the cited references.

Claims 26 and 28, dependent from claim 25 (and indirectly from claim 1), were rejected under 35 U.S.C. § 103(a) as being unpatentable over Buscema and Feldgajer in view of Rose (U.S. Patent Application Publication No. 2002/0178132). Claim 27, dependent from claim 25, was rejected under 35 U.S.C. § 103(a) as being unpatentable over Buscema and Feldgajer in view of Breed (U.S. Patent Application Publication No. 2003/0002690). Claim 29, dependent from claim 25, was rejected under 35 U.S.C. § 103(a) as being unpatentable over Buscema, Feldgajer and Breed in view of Lapointe et al. Rose is understood to disclose an adaptive signal recognition system using a reiterative algorithm. Breed is understood to disclose a system employing sensors and transducers for determining the status of a person inside a vehicle. Neither of these references discloses or suggests a method including distribution of database records, an evolutionary algorithm, or using a distribution of database records associated with a selected prediction algorithm in supervised learning, as recited in claim 1. It follows that neither references discloses or suggests a system for carrying out this method, as recited in claim 25. Accordingly, neither Rose nor Breed remedies the above-noted defects of Buscema, Feldgajer and Lapointe et al. as references against the inventions defined in claims 26-29. Claims 26-29 therefore would not have been obvious from the cited references.

The other claims in this application are dependent from one or the other of the independent claims discussed above and are believed to be patentable for the same reasons.

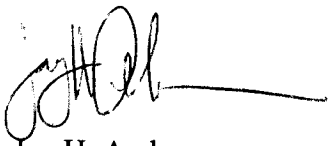
Since each dependent claim is deemed to define an additional aspect of the invention, however, the consideration of each claim on its merits is respectfully requested.

In view of the foregoing amendments and remarks, favorable consideration and early passage to issue of the application are respectfully requested.

The Commissioner is hereby authorized to charge any fees which may be required for this Amendment, or credit any overpayment, to Deposit Account No. 50-1561 of Greenberg Traurig, LLP.

The applicant's undersigned attorney may be reached by telephone at 212-801-2217. All correspondence should continue to be directed to the address given below, which is the address associated with Customer Number 32361.

Respectfully submitted,



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